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ABSTRACT

The Department of Community Medicine of the Mount Sinai School of Medicine (New York City), in cooperation with the TelePrompTer Corporation and with funding from the Health Services and Mental Health Administration of the Department of Health, Education, and Welfare, has developed a bidirectional television system using coaxial cable which links a pediatric office at the Medical Center to an outreach pediatric clinic in East Harlem, about a mile and a half away. The pediatric staff at the Medical Center can be in audiovideo contact with the clinic staff and patients and vice versa. Although the system has been in operation for only six months, its value is unquestioned. Cable television can be used as an extender of medical expertise to the medically disadvantaged. (Author)

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PEDIATRICS AND CABLE TELEVISION

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ABSTRACT

The Department of Community Medicine of the Mount Sinai School of Medicine (New York, New York), in cooperation with the TelePrompTer Corporation and with funding from the Health Services and Mental Health Administration of HEW, has developed a bi-directional television system using coaxial cable which links a pediatric office at the Medical Center to an outreach pediatric clinic in East Harlem, about a mile and a half away.

The pediatric staff at the Medical Center can be in audio-video contact with the clinic staff and patients and vice versa. Although the system has been in operation for only six months, its value is unquestioned. CATV can be used as an extender of medical expertise to the medically disadvantaged.

Although CATV is almost 25 years old, its full social impact is still not apparent. It has not, as the Sloan Commission suggested, had an impact on the order of the printing press some 500 years ago.

It has long been recognized that of all the media, only CATV has the potential for true bi-directionality. But this application of CATV has been limited, largely because of costs and commercial viability.

If the optimun social impact of CATV is to be realized, its capacity for bi-directional video should be stressed. One area in which this capacity is of prime importance is health.

The thrust of this paper is to describe this application of CATV which the Department of Community Medicine of the Mount Sinai School of Medicine (New York, New York) has been utilizing in pediatrics.

We at Mount Sinai are in a unique position vis-a-vis CATV in that we are located in the franchise area of the TelePrompTer Corporation. Because of this, the Department of Community Medicine has established a Section on Communication for the express purpose of exploring ways to establish a unique partnership between a voluntary medical setting and the private sector of CATV.

The fields of pediatrics and geriatrics were chosen for our first projects because these are the areas of greatest medical risk. They also lend themselves particularly well to the type of application we will describe. The pediatric project which we will discuss today is already in operation. We hope to have the geriatric project operational by fall 1973. Perhaps we can report on that activity at next year's NCTA Convention.

To understand this project in pediatrics, some background is necessary. The Mount Sinai Medical Center is located on the edge of East Harlem, a typical inner city with all the attendant problems. Although East Harlem has two medical schools and four hospitals, the people in this community do not adequately avail themselves of existing health services. This is not unique to East Harlem; this problem is replicated across the United States and even abroad. In Britain, where health care is free, a study revealed that only one person out of four with specific symptoms sought medical assistance.

Health institutions, therefore, have found it necessary to establish outreach facilities, saying in effect: If the people don't come to us, we will go to the people.

One such outreach facility in pediatrics was established in the heart of East Harlem at the Wagner public housing project. This Clinic sees both well and sick infants.

Most clinics have a physician in charge, assisted by nurses, who in turn are assisted by para-professionals. The Wagner Clinic follows a different organizational pattern, that of a team approach to health care delivery.

The Clinic has two co-directors, a physician and a nurse practitioner, who share equal responsibility. They spend only part of their time at the

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Clinic, inasmuch as they must spend time at the Medical Center where they have patient care, teaching and administrative duties as well.

Another unique feature of the Wagner Clinic is the expanded role of the nurse who administers most of the health care procedures, utilizing the services of physicians in perhaps 25% of the cases for the more complex medical problems.

When we say we go to the people, we mean that literally. It is not enough to establish an outreach clinic for people to come to. Patients must be actively sought. At the Wagner Clinic, teams of specially trained community health workers, coordinated by the nurse practitioner, spend one week in the field visiting patients and prospective patients, and the next week at the Clinic.

The problem of providing health care is very complex. No one has ever satisfactorily defined "good health." When we apply the term, we use the World Health Organization's definition: "The state of physical, mental and social well-being, not merely the absence of disease or infirmity."

This means in order to provide health care, we must pay attention to the social, economic, and emotional aspects of a patient's problem. In fact the kinds of problems presented to outreach facilities in inner cities rarely relate to purely physical illnesses. In most situations, illness cannot be satisfactorily treated without relating to the social and family problems. One of the difficulties is that physicians are not prepared to deal with this aspect of health care, while the nurses at the Wagner Clinic are. These specially trained nurses can relate to the total patient problem.

The difficulties of providing appropriate personnel for an outreach facility are manifold. Although the facility requires the services of physicians, pediatricians, orthopedists, psychiatrist, social workers, etc., they are not required on a full-time basis. Not only would it be impossible to provide such full-time personnel, but it would be a waste of much of their time.

It is, of course, possible to have these highly skilled individuals travel to outreach facilities for an hour or two on specific days. However, this, too, would be a terrible waste of time spent in travel which should be devoted to treatment. For example, we found that one psychiatrist was spending more than 25% of her time just traveling between a medical center and a number of health clinics.

Here, then, we have the Medical Center with all the vital expertise, and the outreach Clinic in need of such expertise, but only on a part-time or ad hoc basis. The problem is how to make the most effective and efficient use of such personnel. This is where cable came in.

What did we do? The TelePrompTer Corporation, intrigued by our project, has provided excellent cooperation and assistance for which we are indeed appreciative. They agreed to lay a bi-directional cable line, linking the Wagner Pediatric Clinic in East Harlem to the office of the Clinic co-directors at the Medical Center about two miles away. This cable link provides audio-video contact between these two points throughout the working day.

At each cable terminal, we have a Telemation camera with a 9-inch direct video monitor, an RF modulator (Channels 3 and 8 are used) and a 19-inch receiver to pick up the signal from the sending source. Ancillary equipment such as a sync generator, audio mixers, lavalier and fixed microphones, wide-angle and zoom lens, were provided as required.

The equipment at the Clinic is mounted on a movable cart and cable outlets were installed at each of the eight clinic rooms, thus allowing for reciprocal contact from any point in the Clinic to the co-directors' office at Mount Sinai.

The equipment at the co-directors' office is mounted on a console which includes a special effects generator with a genlock and a videotape recorder.

The cable amplifiers have a capacity of 300 MHz of which we are using only 6 MHz in each direction. This allows us ample room for future expansion to multiple locations and will permit the addition of a variety of diagnostic instruments.

The project was funded by The Health Services and Mental Health Administration of HEW. It became operational in December, 1972 and has been used continuously since then.

Getting the physicians and nurses to use the equipment was not an easy task. Health-care providers, although skilled in handling the intricacies of the human body, were fearful of television equipment. They were convinced that touching a dial or switch would surely result in breakage. It took several months to convince them otherwise, and even now some are more hesitant than others to use the system. One health provider responded negatively because she thought she "looked terrible" on the television screen. It took some time to convince her that this was not really so.

The children, as we anticipated, are delighted to be on television. They are more willing to come to the Clinic and it is occasionally difficult to get them away from the system. This can, at times, create a minor inconvenience to the physicians and nurses, particularly when they examine ears. For instance, the child might be viewing himself on the monitor and refuse to turn away from it in order for the doctor or nurse to look at the other ear. The health provider must then walk around the table to complete the examination.

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Our greatest concern was the acceptance of the system by the parents of the children. It would be very easy for telemedicine to be viewed as second-class health care in a ghetto community. We wanted to convince the parents that what we were doing was enhancing health delivery, not reducing it.

Long before the system was put into operation, meetings were held with mothers to explain what we were doing and to answer questions. The community rapport is such that there was ready acceptance of the system which has been further enhanced with its continued use. Interestingly, one of the questions of concern to mothers was, "Now that we are going to be on television, do we have to get dressed up when we come to the Clinic?"

One indication of acceptance of the system is the fact that over 300 mothers have signed the release form to appear on television and be videotaped. Only two have refused and these were very special situations.

The system is left on throughout the working day. The cable link provides the co-directors with the feeling that they are also present at the Clinic when, in fact, they are really in their Medical Center office. At such times, the Clinic staff can reach them almost instantly without having to go through the hassle of a hospital telephone switchboard. The face-to-face contact via video is far superior to telephone both in ease of explaining, and knowledge gained, through facial expression and body language, that what has been explained has been understood.

Physicians and nurse practitioners at the Clinic can obtain back-up when needed from the Clinic co-directors and others at the Medical Center. Health providers can consult with Clinic patients and parents as well as Clinic staff. Specialists at the Medical Center, who would ordinarily not be able to travel to the Clinic without considerable time loss, are now available on a regular basis for teleconsultation. These include areas of orthopedics, nutrition, psychiatry and social service.

Triage is accomplished by designating those children who can be treated at the Clinic and those requiring specialized services administered at the Medical Center. This has already resulted in reduction in the number of patients referred to the Medical Center. Such visits involve considerable difficulty for parents in terms of travel time, waiting time, transportation costs, need for baby sitters, etc.

We have added several components to the system, including a Hewlett-Packard heart sound amplifier, and we are discussing with NASA the possibility of adding various physiological monitors for which there is ample channel space on the cable.

We have learned much over the past six months, but we have a long way to go. We have made challenging telediagnosis in a small number of cases, but to play it safe, we still seek clinical confirmation. Thus far, every such telediagnosis checked out accurately. We are batting 1,000.

As noted previously, the system has the capability to videotape transactions. Our initial experience with this was slightly disasterous. We attempted to use split-screen in order to have the health providers and patient appear at the same time. However, we found it impossible to get either the physician or the patient to stay within camera range or focus because we do not employ a technician. We believe we have the world's greatest collection of videotapes of decaptiated individuals. We are now using a fade in/fade out technique which is much more effective. However, it is still taking time for the physicians and nurses to use this technique while simultaneously providing health care.

The videotapes have been used to give the health-care providers a second look at their treatment modalities. We feel this has been helpful in improving health-care delivery. We have also used videotape for recording unusual cases, for staff training and, eventually, we will use the tapes for longitudinal research.

Many problems remain to be worked out. There are not adequate funds to convert the system into color, to hire technicians, videotape editors, etc. which would enhance the system's usefulness. We would also like to obtain a remote control pan, tilt and zoom system so that the providers at the Medical Center can control what is viewed at the clinic.

There is a need to develop special instrumentation for diagnosis over cable such as fibreoptic otoscopes for ear examinations. But this has been too costly for manufacturers to do in view of the limited market potential.

The question frequently put to us is, how can a physician or nurse at one end of the cable see into the child's ear or determine color of a skin lesion via a black and white system. The answer is that they cannot; and yet they can. This is so because the personnel at the Clinic can serve as an extension of the provider at the Medical Center by describing the condition of the middle ear, the morphology of a skin lesion and the result of palpation of a patient's abdomen.

Telemedicine, particularly via bi-directional cable, has important implications in the delivery of health care. The field is in its infancy. We have much to learn, but based upon our experience to date, we can say to you, in the words of Lincoln Steffans, "We have seen the future, and it works."

We plan to expand the cable link to other child health stations, to schools, day-care centers and the like. Eventually we hope to be able to reach parents in their homes to provide health education.

Thus we say to you, "Go ye and do likewise."